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this is overlaid by a pliocene formation, containing some of the fossils of the Equus beds of central Oregon. This is both underlaid and overlaid by basalt, and other volcanic products.

The regions of the John Day river and Blue mountains, furnish sections of the formations of Central Oregon. Above the Loup Fork or Upper Miocene, there is a lava outflow, which has furnished the materials of a later lacustrine formation, which contains many vegetable remains. The material is coarse, and sometimes gravelly, and it is found on the Columbia river, and I think also in the interior basin. Prof. Condon calls this the Dalles group. It is in turn overlaid by the beds of the second great volcanic outflow. Below the Loup Fork follows the Truckee group, so rich in extinct mammalia, and below this a formation of shales. These are composed of fine material, and vary in color, from a white to a pale brown and reddish-brown. They contain vegetable remains in excellent preservation, and undeterminable fishes. The *Taxodium* nearly resembles that from the shales at Osino, Nevada, and on various grounds I suspect that these beds form a part of the "Amyzon group" (this Journal, 1879, p. 332), with the shales of Osino and of the South park of Colorado. Below these, is a system of fine grained, sometimes shaly rocks of delicate, gray buff and greenish colors, containing calamites, which Prof. Condon calls the *Calamite* beds. Their age is undetermined.—*E. D. Cope.*

GEOGRAPHY AND TRAVELS.[1]

Arctic Voyages.—The east coast of Greenland from 69° N. lat. to 65° 18′ has never been laid down until the past summer, when the Danish man-of-war steamer *Ingolf*, reached that part of the coast, sailing from Iceland. Having fixed the positions of some high lands south of Scoresby land, the Danish Hydrographic office has been able partly to fill up this blank on their maps.

It was also found that the ice cold water of the sea bottom, never passes the submarine heights stretching from the Faroe islands to Iceland, and that the depth of the sea decreases considerably in about N. lat. 67°, where it varied from 150 to 200 fathoms, and large icebergs were met with.

Further to the eastward, the temperature of the deeper water rose gradually, while on the surface the rise was sudden—in one case from 1° to 7° C. [33°. 8 to 44°. 6 F.] in an hour; in a distance of five miles the depth of the sea increased from 160 to 505 fathoms and in the Gulf stream to 1005 fathoms.

An immense bank was discovered, running from the north-west coast of Iceland, almost to the Greenland coast, and helping to keep the cold polar streams from the Atlantic.

M. Kornerup, a member of the recent Danish expedition into the interior of Greenland, mentioned in the NATURALIST for April, states, that in the course of his explorations in the ice fields of the interior, he ascended a hill, the top of which was covered with flowers, and vegetation ; several kinds of small animals being also found there.

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[1] Edited by Ellis H. Yarnall, Philadelphia.

We learn from the *Proceedings of the Royal Geographical Society*, for February, 1880, that a Norwegian Captain Kjelsen, attained a very high latitude on the Spitzbergen meridian last year, sailing, about the 12th of September, sixty nautical miles northward from the Seven islands. No ice could be seen, nor any ice blink on the northern horizon. The latitude is not given, but could not have been far short of that reached by the Swedes in 1868, 81° 42′ N., and may possibly have exceeded it.

While the Arctic sea was thus unusually open to the north of Novaya Zemlya and Spitzbergen, the Sea of Kara was full of ice throughout the season, and only one vessel finally succeded in penetrating it, and made the voyage out and back from Bremen to Yeniseisk.

The Russian government established, in 1878, Karmahul harbor [72° 30′ N. lat.] in Möller bay, Novaya Zemlya, a station for the relief of ship-wrecked sailors and also directed the taking of a series of meteorological observations for a whole year. Lieut. Tiaguine was placed in command, and with his wife, children, three servants and five Samoyede families, passed the winter of 1878–9 on the island. The autumn was rainy and cold. The average temperature was about 39° .20 F. The first frost was on September 26, the first snow, on September 28, and the sea froze on October 10. Drift ice was seen in the middle of October, and on November 13, the harbor and small bays were frozen over. Möller bay, however, did not freeze during the whole winter, except among the islands. The first thaw happened in the middle of May, and by June 14 the small islands were covered with verdure, but the harbor was not clear of ice until July 16. The mean temperatures were November, 49° .64 (F.) February, 0° .04, March, 10° .76. During the five winter months, the mean temperature was 10° .04. The wind varied considerably, sometimes rising to violent storms from E. S. E. A small quantity of snow fell, but was blown into deep drifts. Three of the Samoyedes died from scurvy, having refused to take exercise, or follow Lieut. Tiaguine's recommendations. The rest returned well to Archangel in August, 1879. Lieut. Tiaguine considers wintering in Novaya Zemlya quite practicable, but a supply of provisions is absolutely necessary, as it seems impossible to obtain by hunting, anything like a sufficient quantity of animal food during the winter.

A New edition of the "Narrative of the North Polar Expedition,"—the voyage of the *Polaris*, under Capt. Hall, has been authorized by Congress, provided the number of subscribers shall reach 500. Orders may be sent to Mr. A. F. Childs, Government

Printing Office, accompanied by the price of the volume, $2. This is likely to be the last opportunity of obtaining the volume.

It is also to be hoped that another edition of the narrative of the second Arctic Expedition made by Capt. Hall [reviewed in our last number], to be sold at cost price, will also be ordered. The demand for it has been very great, and the first edition was very quickly exhausted.

An Italian Antarctic Expedition is proposed by Lieut. Bove, who was one of the officers under Nordenskiöld on the *Vega*. It is to sail in the spring of 1881 and touch at Monte Video, Terra del Fuego, Falkland and South Shetland islands, and proceeding in a south westwardly direction, commence explorations, expecting to be engaged for two winters in the Antarctic region, and return by way of Hobart Town. The expenses are estimated at 600,000 lire.

THE HOWGATE ARCTIC EXPEDITION.—The following bill has passed the U. S. House of Representatives, and been favorably reported to the Senate:

A BILL to authorize and equip an expedition to the Arctic Seas.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the President of the United States be, and he hereby is, authorized to establish a temporary station at some point north of the eighty-first degree of north latitude, on or near the shore of Lady Franklin Bay, for the purposes of scientific observation and exploration, and to develop or discover new whaling-grounds; to detail such officers or other persons of the public service to take part in the same as may be necessary, and who are willing to enlist for such purpose, not exceeding fifty in number, and to use any public vessel or vessels that may be suitable for the purpose of transporting the members of said station and their necessary supplies, and for such other duty in connection with said station as may be required from time to time: *Provided*, That the President of the United States is authorized to accept from H. W. Howgate, and fit out for the purposes of this expedition, the steamship *Gulnare*, which vessel shall be returned to its owner when the objects of the expedition shall have been accomplished, or when, in the opinion of the President, its services are no longer required: *Provided further*, That the United States shall not be liable to any claim for compensation in case of loss, damage, or deterioration of said vessel from any cause, or in any manner whatever, nor be liable to any demand for the use or risk of said vessel.

We learn from Capt. W. H. Howgate, that the steamer *Gulnare* is of about 230 tons burden, and will have a crew of fifteen, officers and men all told. The expeditionary party which will be left at the station while the vessel returns to the United States, will consist of twenty-five men, including the necessary scientific corps.

It is hoped that the exploring party can be landed at some point on or near the shore of Lady Franklin Bay in time for the *Gulnare* to return home this season. The *Gulnare* is being fitted up for ice navigation under the superintendence of Capt. Chester, who was with Hall in the *Polaris*. A house of wood, double boarded, 21 x 68 feet, modeled after those used by the Hudson's Bay Company, is being constructed for the men to winter in on the shores of Discovery harbor. A steam launch will probably form part of the expedition. The purposes and intentions of this new attempt at Polar discovery are given in the report of the House Committee as follows:

"In making this report the committee respectfully state and report that the object of the bill, as is shown by its terms, is to authorize a temporary station to be selected within the Arctic circle, for the purpose of making scientific discoveries, explorations, and observations, obtaining all possible facts and knowledge in relation to the magnetic currents of the earth, the influence of ice-floes therefrom upon the winds and seasons, and upon the currents of the ocean, as well as other matters incidental thereto, developing and discovering at the same time other and new whale-fisheries, now so material in many respects to this country. It is, again, the object of this bill that this expedition, having such scientific observations in view, shall be regularly made for a series of years, under such restrictions of military discipline as will insure regularity and accuracy, and give the fullest possible return for the necessary expenditure; and, again, in view of the fact that either the governments directly, or scientific corps under their authority, of Germany, Holland, Norway, Sweden, Austria, Denmark, and Russia, have concurrently agreed to establish similar stations, with like object, during the year 1880, it is believed that the interests and policy of our people concur in demanding that the United States should coöperate in the grand efforts to be thus made in the solution of the mysteries and secrets of the North Polar seas, upon which, in the opinion of scientists, depends so much that affects the health and wealth of the human race."

MICROSCOPY.[1]

ADULTERATIONS OF FOOD.—Adulterations or impurities of food may be divided into three classes. First, deleterious adulterations; these are such as are directly injurious to health, such as red lead in cayenne pepper, chromate of lead in mustard, or water in milk. The second class, and by far the largest, is what may be called fraudulent adulterations. These injure the pocket rather than the health. This class does not properly come under the notice of the health officer, but is a fraud upon the general public, which should be taken notice of by mercantile associations. This

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[1] This department is edited by Dr. R. H. WARD, Troy, N. Y.